2012 UDOT RESEARCH PROBLEM STATEMENT

Problem Title: Implementation of a Sign Management Plan & System for UDOT **No.:** 12.02-5 / 12.03-10

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UDOT Champion (suggested): R. Lindsey & W. Starkenburg **Group/Region/Division:** Maintenance/Traffic & Safety

1. Describe the problem to be addressed.

Previous research developed a data collection strategy to help UDOT understand the challenges in managing sign management. With budgetary constraints it is imperative to utilize a strategy that will provide both efficiency and compliance. The previous experience of the research team helped highlight previously unknown issues to UDOT, such as the rotational sensitivity of the signs and the extent of damaged signs. Many unique conditions and situations that directly affected traffic sign management were found though the data collection procedure. As these considerations were identified and incorporated into the process the continuing insight provided for a better overall understanding of how the sign assets were performing.

The previous research also provided a valuable assessment of overall compliance with the MUTCD minimum retroreflectivity requirements. Utilizing a methodology that included the collection of sign and sight condition attributes provided the information necessary to develop a retroreflectivity management plan that considers UDOT's own assets and the most economical and feasible steps to ensure compliance. Outside of Type I sheeting used by the state, the majority of UDOT's assets are currently in compliance with the new MUTCD standards (91%). With the complete removal of Type I signs the percentage of compliant signs would increase to 97%. The data collected throughout the state, and the results from analysis of the data from the project, may now be used in the development of the plan. The high percentages of damaged signs found, as well as limited installation and service life performance data currently available to UDOT, indicate that an assessment method, either visually or through measurements, will best serve for maintaining retroreflectivity compliance until further information is available.

The compliance rates of various sheeting types provided for quick assessments of alternatives for bringing the DOT's current assets up into compliance with MUTCD standards. Given the high failure rate of Type I signs within the state, an initial blanket replacement of all Type I signs and tracking the performance of the replacements would be very beneficial. The data collected also provides for operational changes that has potential of bringing greater efficiency and performance of UDOT's assets. By carefully planning the collection procedure, a better overall understanding of the materials and maintenance practices between maintenance stations and between regional oversight. Dividing collection proceedings in this manner allowed for better understanding and facilitated data collection that better represented the overall population. This information informed the development of plans for the maintenance and coordinated replacement of signs for the state. The next step in the process is to implement the management plan and policies in a mechanistic way to ensure better management of the sign assets.

2. Describe why this research is important and how it is unique.

Managing the retroreflectivity of signs presents many unique challenges. Implementing an efficient management strategy involves understanding conditions that contribute to accelerated deterioration of retroreflectivity as well as the effectiveness and cost requirements of the various management methods. These considerations are unique to the conditions and budget constraints for UDOT and local governments. In addition, successful implementation of this plan requires knowledge and coordination with UDOT's OMS and data collection efforts. Implementation of this plan and system will provide large cost savings to UDOT over the long term of better management of their sign assets.

3. List the research objective(s) to be accomplished:

1. Identify linkages to the OMS System and how to interact with the OMS system.
2. Develop a tool to download data from the OMS system and analyze the data.
3. Implement a predictive tool to forecast sign degradation over a 5 year timeframe
4. Implement a system to collect data on new sign installations
5. Implement a budget planning tool which will support changing levels of funding for sign management and will support several different maintenance goals.

4. List the major tasks to accomplish the research objective(s):

1. Identify linkages to the OMS System and how to interact with the OMS system.
2. Coordinate with UDOT to develop a module that will interact with the OMS system. This module will run in a windows format and will be compatible with the OMS system but will operate outside of the OMS system.
3. Coordinate with Data Collection (Mandli) to determine data to be collected and the format of the data to be collected.
4. Develop a tool to download data from the OMS system and analyze the data.
5. Implement a predictive tool to forecast sign degradation over a 5 year time frame.
6. Download of data collected by Mandli and analysis of the data that was collected.
7. Implement a system to collect data on new sign installations. This system will run on laptops and the Android smart phone.
8. Implement a budget planning tool which will support changing levels of funding for sign management and will support several different maintenance goals. The tool will include features that will help it learn with experience and additional data provided to it.
9. Provide a comprehensive report detailing the results of the study.

5. List the deliverable(s) to come to UDOT from this research study:

1. A tool that interacts with OMS to download sign data.
2. A tool that analyzes the data, predicting a 5 year deterioration, and provides budgetary guidance for UDOT.
3. A final report detailing all activities of the research.

6. Describe how the results of this study will be implemented at UDOT.

1. The project is about implementation of previous research.

7. Estimated cost - Total: $155,000 **UDOT Share:** $50,000 **Matching Funds:** $75,000

8. Outline the proposed schedule for this study, including estimated start date, duration, and major event dates.

The following schedule is proposed for this study. The study is scheduled for 18 months.

- Start Date: June 1, 2012
- Offline Tool for OMS: December 1, 2012
- Online Tool for OMS: May 31, 2013
- Predictive Tool for OMS: September 3, 2013
- Final Report: December 31, 2012